OM-7815-000-06

OPERATING MANUAL

TYPE 7815-000-06 TZ/OBC TRANSPONDER

ISSUE A

REVISION 0

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SOUND IN DEPTH

AMENDMENT RECORD

All amendments and additions will be issued with a new copy of this sheet, recording the history of amendments.

Issue	Revision	Date	Comments	Section	Page
A	0	10.10.01	Initial Issue	All	All

SECTION 2

2. OPERATION

2.1 INITIAL CHECKS

On receipt the unit will be in a fully working condition, with the internal battery pack fitted and connected, the unit being ON. Note that some special shipping regulations dictate that the battery pack is shipped separately – if this is the case the shipping documentation will acknowledge this.

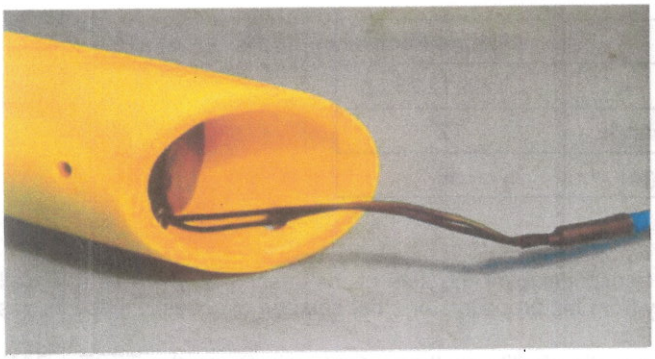
2.2 PROGRAMMING

The unit will be programmed to the default acoustic identity which is 005-5 (interrogation address 005, frequency 5). Unless the default identity is to be used you will need to program the unit to an identity of your choice. Try to ensure that the same identity is not already used within the operational area.

To program the transponder use the Type 7967 Transponder Programming/Test Unit. Select the interrogation address (1-401) and then the reply code/frequency (1-9). Place the programming loop tightly around the black transducer inside of the yellow housing as shown below and press the PROGRAM button. The surface unit will program and then test the transponder, it will display **PASS** and beep once to confirm successful programming. **FAIL** will be display and no beep will be heard if unsuccessful. An additional test can be carried out by pressing the TEST button if required, although not necessary.

Follow the instructions on short-form instruction sheet inside the lid of the Type 7967 yellow box.

The programmed acoustic identity is stored in non-volatile memory, therefore if the battery is disconnected for any period of time the programmed identity is not lost.



You can only program the transponder using the loop not the remote transducer. This is an interlock to ensure that no transponders already deployed in the water are accidentally programmed.

With a water-proof label or permanent pen mark the acoustic identity clearly on the yellow housing. Make a permanent note of the transponder identity (& serial number if required) on file.

NOTE: For use with Sonardyne's Homer-Pro and/or ROV-Homer system, only use address groups 004 to 013, all reply frequencies (81 unique IDs). See Appendix A.

WARNING: Once deployed there is no way to automatically read a transponder's programmed identity without cycling through all available identities.

2.5 ATTACHMENT USING 'CARAPACE'

The transponders can be attached on to the cable section using the Sonardyne manufactured 'Carapace'. This is a Polyethylene plastic shell that protects the transponders from damage, co-locates the transponder and RFID tag and eliminates the need for large numbers of tie-wrap and tape that require regular maintenance.

Open the Carapace and place the cable into the hinge section. The Carapace is designed to fit cable of 1.42 inches (36.1mm) to 1.57 inches (39.9mm) diameter. Cable of smaller diameter will require some additional packing with tape etc as can be seen in the picture to the left.

Put the 2 o-rings provided around the outside diameter of the transponder and place the transponder inside the Carapace. Put the RFID tag (optional) into the slot provided and close the shell of the Carapace.

The clamp to the cable insert the stainless steel U bolts with clamp plates as shown. Note that depending on the cable diameter only 1 clamp plate may be needed – place this on the side of the nuts to ensure they do not wear through the plastic.

For reference mark the acoustic identity of the transponders in black permanent marker on the outer shell.

2.6 OTHER ATTACHMENT METHODS

Transponders temporarily 'looped' onto the fixing point as the cable is deployed.

SECTION 3

3. MAINTENANCE

3.1 BATTERY CHANGING

The battery packs can be changed in the field without any specialist equipment. It is very important to ensure that a clean and dry environment is available when dismantling the unit.

Step 1

Carefully unscrew the two stainless steel M5 cap head screws in the bottom endcap and allow the red plate to float off the endcap (Allen key size ?).

The endcap contains an interlocked safety system that prevents the unit being opened unless all internal pressure has been released.

If the battery pack has failed or water has penetrated the internal housing the battery pack may vent gasses causing the build up of internal pressure.

If the internal pressure is very high, the transducer endcap will dislodge from the top of the yellow housing so venting any large build up of gas.

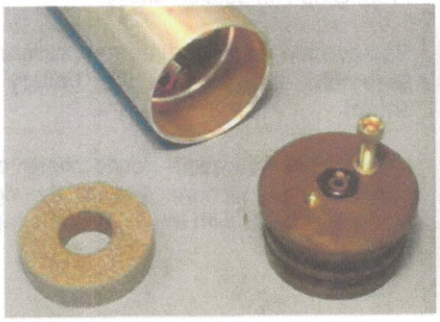
Any low pressure build up of gas will be vented as the unit it taken apart, gasses being expelled from the circumference of the red plate.

As the screws are released the red plate releases the pressure on a face seal o-ring so venting any build up of pressure in the internal housing.

WARNING

- **Sealed devices containing battery packs can produce dangerous high internal pressures. Treat all units with care and ensure all safety guidelines are followed.**
- **Wear protective clothing and glasses during dismantling.**
- **Ensure the transponder is pointed away from the body and face.**
- **Ensure that dismantling takes place in a well ventilated area to prevent the inhalation of possible of harmful gasses.**

Step 6



Remove the endcap from the housing by twisting and pulling. Note that as shown one of the M5 screws can be used in the endcap to help grip the endcap during removal.

Remove the foam packing ring from the internal assembly to uncover the battery pack and connection onto the electronics.

Step 7

Using a pair of needle nosed pliers grip the battery connector (to the left of the electronics PCB with the PCB at the top) or wires and pull, so removing the old battery pack from the pressure housing.

Measure the voltage of the old battery pack, end of life is 9 volts.

Measure the voltage of the new battery pack, this should be >12.4volts.

Slide the new battery pack back into the pressure housing, ensure the battery pack does not jam against the transducer lead.

Using the needle nosed pliers reconnect the white molex connector onto the battery connector on the PCB (marked BATTERY). Ensure the connector 'snaps' in place.

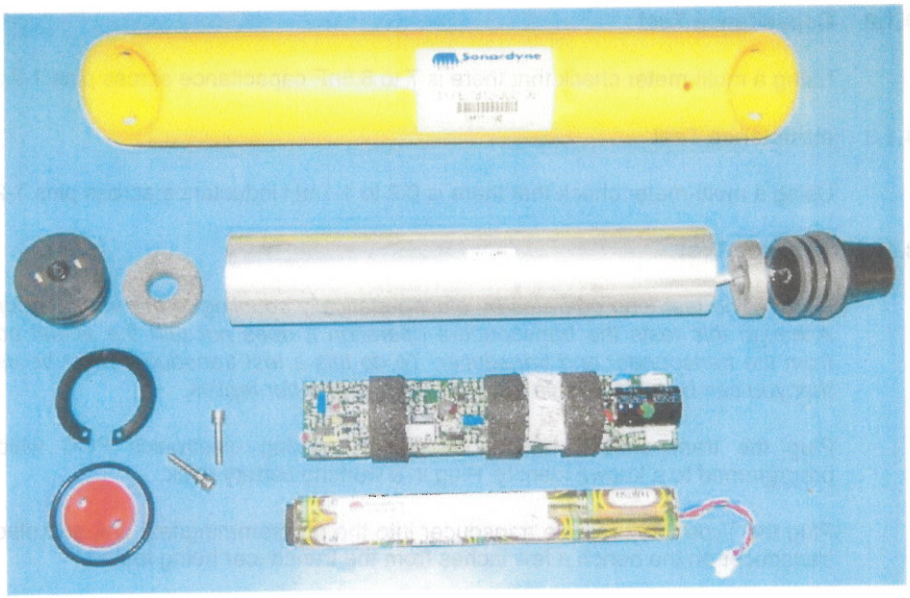
Now immediately test the transponder on its programmed identity, ensure that an audible 'click' can be heard from the transducer and a beep from the programming unit. Press the BATTERY button to measure the battery voltage via the transponder.

Step 8

Carefully clean with tissue paper the inside sealing surface of the pressure housing. Inspect the sealing surface for scratches/damage – replace housing if corroded or damaged. Wipe with thin coat of Vaseline Petroleum Jelly or equivalent non-corrosive grease to aid assembly.

Carefully remove the o-rings from the bottom endcap – clean, inspect, replace and re-grease as necessary. Any damaged o-rings should be replaced. Carefully clean and inspect o-ring grooves in endcap. Endcaps with damaged o-ring grooves should be replaced.

Retrace Steps 6 to 1 to re-assemble the transponder.



The picture above shows all the component parts of the Type 7815-000-06 transponder.

3.3 GENERAL MAINTENANCE

Periodically remove the inner transponder assembly to reveal the anodised aluminium pressure housing. Check for any signs of corrosion due to damage or pitting of the anodising. If corroded replace or clean with wire brush, de-grease and paint with etching primer and paint to protect area. Alternatively replace the housing.

Ensure that the transducer is visibly undamaged. Any significant damage to the polyurethane coating can cause a leakage path to the piezo electric ceramic causing acoustics failure of the transducer. Any leakage of water can also possibly enter the inner pressure housing through the transducer causing damage to the PCB.

Ensure that the transducer within the outer housing is free from mud, stones and importantly grease. These can all significantly degrade the acoustic performance. If the transducer is contaminated with grease clean and wash with a mild detergent.

Always wash down the unit with fresh water after use and prior to storage, thoroughly dry the all parts and store in cool dry conditions. This will minimise any long-term corrosion problems.

To maximise battery life in storage, battery packs can be disconnected prior to long periods in storage. Store in cool dry environment - high storage temperatures significantly increase the batteries self drain characteristics and therefore remaining life.

3.4 FAULT FINDING

3.4.1 Transducer

3.4.1.1 **Inspection**

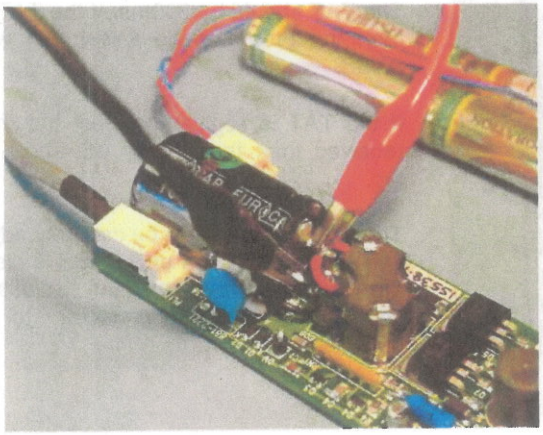
Inspect the black PU coating of the transducer for signs for damage. Impact from sharp objects may penetrate the PU coating and allow water to penetrate the transducer.

Check the white connector for signs of corrosion deposits as these may effect the electrical connection to the transducer.

3.4.3 Electronics PCB

The following tests should be made with reference to 0 volts ground, this can be by attaching the voltmeter to the black wire of the main reservoir capacitor C40.

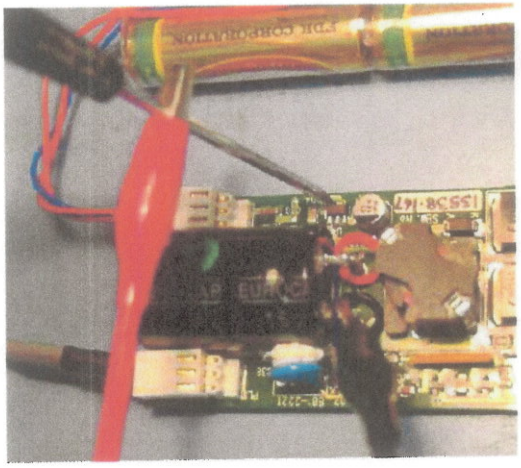
3.4.3.1 **Main Capacitor**



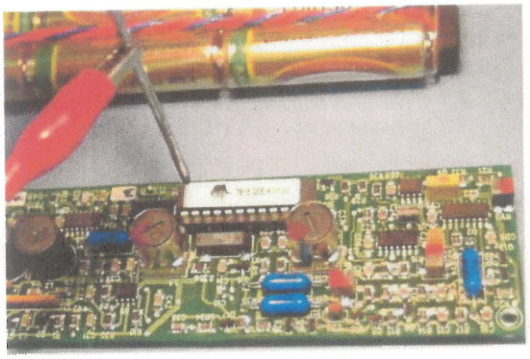
With a known good battery pack connected, check that there is 9-12 volts DC across the red and black wires soldered to the large black capacitor C40.

3.4.3.2 **5 Volt Rail**

The 5 volt rail is supplied by regulator U4.



Input : The input comes from the pin 2 of the battery connector. Check that the input voltage to the regulator is 9 to 12.5 volts (battery pack voltage). This can be checked on directly on the regulator as shown below.



Output : The output from the regulator should be 5 +/-0.2 volts DC. Check the 5 volt output directly on the micro-controller, U3 pin 24 as shown below.

SECTION 4

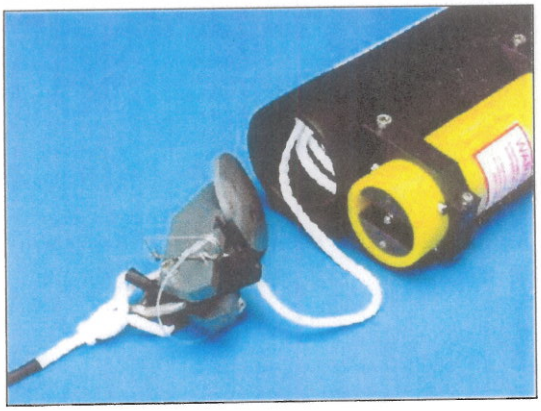
4. TYPE 7986 LRT

The Type 7986 Lightweight Release Transponder (LRT) is compatible with the TZ/OBC transponders. It can be positioned by the same surface system and released by the programming and test unit with remote transducer.

The LRTs can and have been used to recover cable section without the use of surface buoys.

An optional rope canister is available that holds 75m of high strength (1200kg) rope.

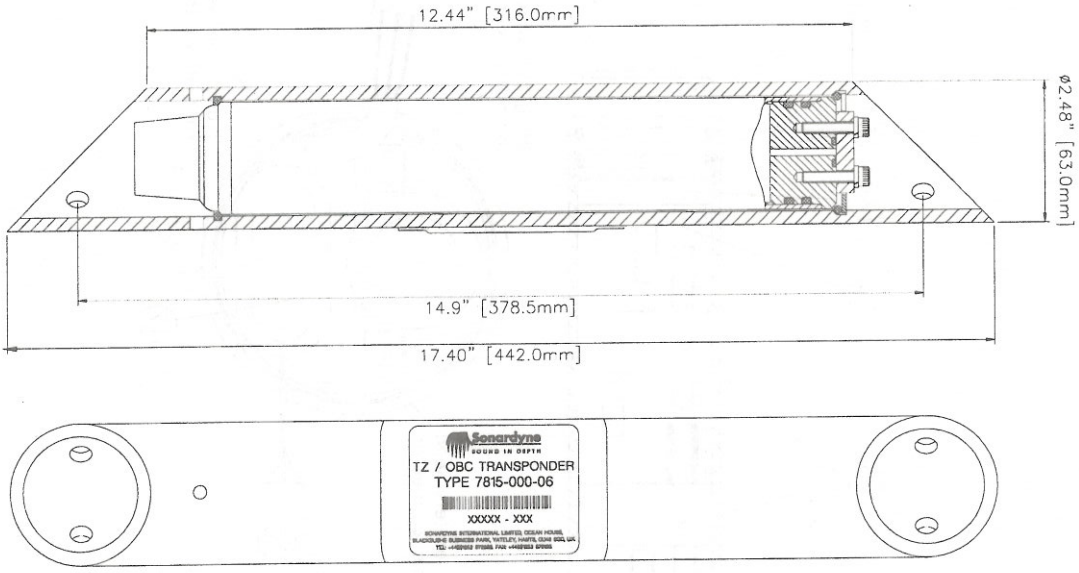
Type 7967-000-02 Programming/Test Unit with remote transducer
Type 7986 LRT, Type 7986-009 Rope Canister and 2 flotation buoys



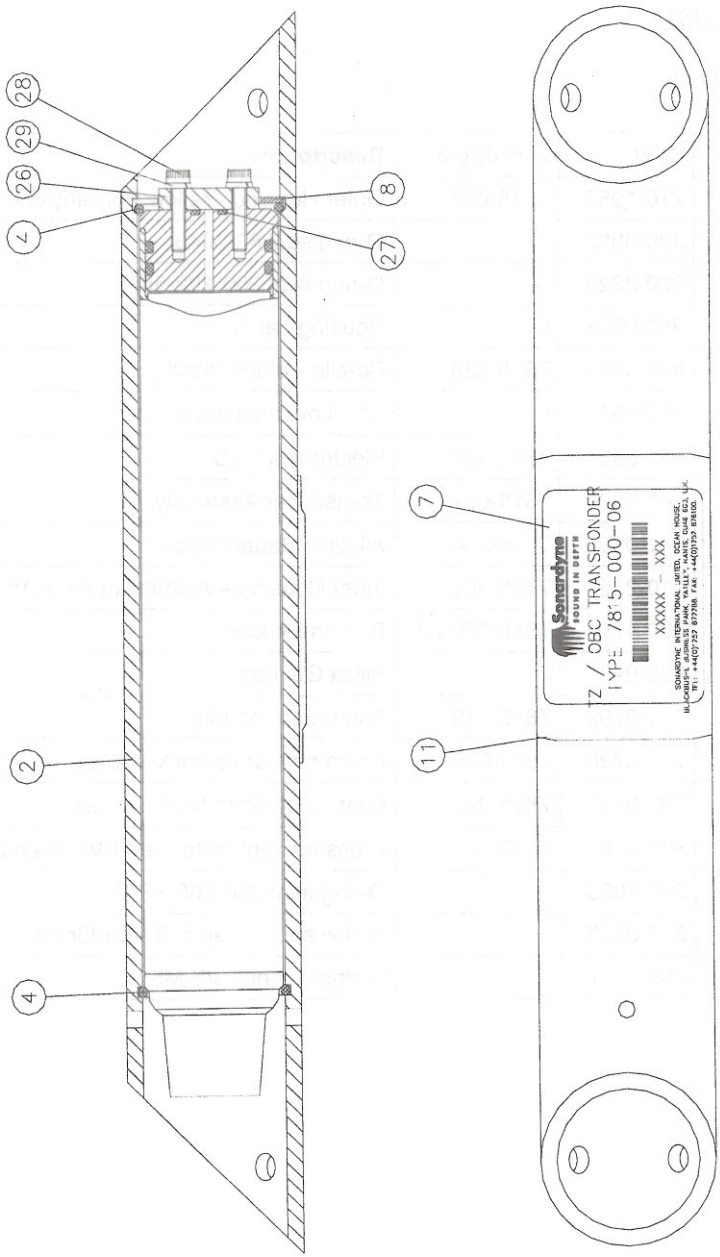
Above picture shows the assembly after the release mechanism has actuated, allowing the rope to spool out of the canister.

SECTION 6

6. DRAWINGS



7815-000-06 Outline Drawing



7815-000-06 Outer-Assembly

APPENDIX A

A. ADDRESS FREQUENCY GROUP CONVERSION TABLE

Sonardyne's Type 7797 Homer-Pro and Type 7832 ROV-Homer systems operator with a shorten form of the acoustic identities that the Type 7986 LRT and Type 7815 transponders operate on. There are also fewer acoustic identities available to the Homer systems, see the conversion table below.

A.1 HOMER-PRO AND ROV-HOMER ADDRESS/FREQUENCY CONVERSION TABLE

Homer-Pro ROV-Homer IDs	Address	Reply Frequency Code
10	004	1
11	005	1
12	006	1
13	007	1
14	008	1
15	009	1
16	010	1
17	011	1
18	012	1
19	013	1
20	004	2
21	005	2
22	006	2
23	007	2
24	008	2
25	009	2
26	010	2
27	011	2
28	012	2
29	013	2
30	004	3
31	005	3
32	006	3
33	007	3
34	008	3
35	009	3
36	010	3
37	011	3
38	012	3
39	013	3
40	004	4
41	005	4
42	006	4
43	007	4
44	008	4
45	009	4
46	010	4
47	011	4
48	012	4
49	013	4
50	004	5
51	005	5
52	006	5
53	007	5
54	008	5
55	009	5
56	010	5
57	011	5
58	012	5
59	013	5
60	004	6
61	005	6
62	006	6
63	007	6
64	008	6
65	009	6